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1930-2017

Millie Dresselhaus Burst Out of the 1940s Mold for Smart Young Women

Physicist became first female winner of National Medal of Science in Engineering



In a 57-year career at MIT, Mildred Dresselhaus did pioneering work in thermoelectric materials. PHOTO: DOMINICK REUTER/MIT

By James R. Hagerty

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As a teenager growing up in the Bronx in the 1940s, Mildred “Millie” Spiewak was one of the smartest students at her New York high school. “Mildred equals brains plus fun,” the yearbook reported. “In math and science she’s second to none.”

Even for smart girls, she figured, there were just three career options: teacher, nurse or secretary.

She chose teaching, but a physics instructor urged her to aim higher. As Millie Dresselhaus, her married name, she became a leading researcher in new materials based on carbon that have promise in such areas as electronics and energy. She was the first woman to become a full, tenured professor at the Massachusetts Institute of Technology and the first female winner of the National Medal of Science in Engineering.

In materials science, she was a star—sometimes dubbed “the Queen of Carbon.” She made a priority of encouraging young women to pursue scientific careers. General Electric Co. recently released a commercial imagining a world in which the likes of Dr. Dresselhaus were treated like celebrities, inspiring young women.

Dr. Dresselhaus died from complications of a stroke Feb. 20 at a hospital in Cambridge, Mass. She was 86.

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In a 57-year career at MIT, she did pioneering work in thermoelectric materials, finding more efficient ways to harvest energy created by differences in temperature between objects, technology that helps provide power in spacecraft. She

did early work in the development of carbon nanotubes, lattices of carbon atoms rolled into cylinders, which conduct electricity and could be used to build faster and more powerful computers.

Her research into graphene, a flexible single-atom-thick slice of graphite, helped create technology with potential applications ranging from golf clubs to smartphones. It also might be woven into clothing or wrapped around all kinds of objects to provide electronic displays. “You could have electronics everywhere,” said Pablo Jarillo-Herrero, an associate professor of physics at MIT.

She was known for helping struggling students. “She was always able to see the best in you and bring it out,” Dr. Jarillo-Herrero said.

A daughter of Polish immigrants, Mildred Spiewak was born Nov. 11, 1930, and raised in a part of the Bronx she later described as dangerous. “My early elementary school memories up through ninth grade are of teachers struggling to maintain class discipline,” she wrote in a brief biography. As a teenager she worked in a zipper factory and as a math tutor.

Through violin lessons, she met adults who told her about the possibility of getting into better schools. She passed exams allowing her to attend Hunter College High School and went on to do her undergraduate studies at Hunter College. A physics lecturer there, Rosalyn Yalow, who later won a Nobel Prize, encouraged her to become a physicist.

After a year as a Fulbright fellow at Cambridge University and further studies at Harvard University, she earned her doctoral degree at the University of Chicago, where her mentors included Enrico Fermi, another Nobel winner. While there, she met her future husband, Gene Dresselhaus, a physicist.

They both joined MIT, partly because, unlike other universities, it was willing to hire couples. The scare caused by the Soviet Union's Sputnik satellite spurred research spending, creating opportunities for young scientists. Dr. Dresselhaus chose to study carbon, which she saw as a backwater, partly because so many others were focusing on silicon and she wanted to do something different.

Her supervisors let her explore widely. "It was kind of an open-ended job," she said in an oral history recorded at MIT. "Those kinds of jobs don't exist today."

In her free time, she played chamber music with friends. Her main passion remained research. Her Toyota Corolla was often parked at MIT before 6 a.m.

Among her many prizes was the 2007 L'Oréal-UNESCO Award for Women in Science. At the time, one of her granddaughters, Leora Cooper, on a school trip to Paris, was stunned to find an airport banner depicting her grandmother as a scientific hero. "I began to realize she was not a normal grandmother," said Ms. Cooper, now a Ph.D. candidate in chemistry at MIT.

In 2014, President Obama awarded Dr. Dresselhaus the Presidential Medal of Freedom.

She is survived by her husband, Gene, their four children and five grandchildren.

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